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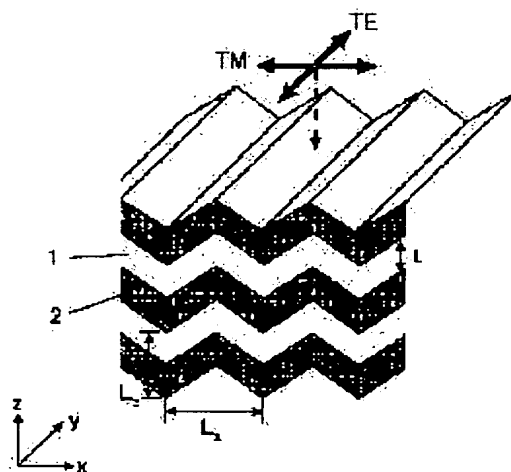
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## (54) DOUBLE REFRACTION PERIODIC STRUCTURE, PHASE PLATE, DIFFRACTION GRATING TYPE POLARIZING BEAM SPLITTER AND THEIR MANUFACTURE

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a double refraction element having large double refractivity having an optical axis in a face, capable of having a large opening area with a small optical path length, and capable of being manufactured at a low cost, by laminating a high refractive index medium, and low refractive index medium by repeating the shape in every period, on a substrate having periodic grooves or the like.

SOLUTION: This structure is a multilayer structure in the z-axis direction comprising two or more kinds of transparent bodies having different refractive indices, and the shape of a layer which is a unit of lamination in each transparent body has a cyclic uneven structure in the x-axis direction. This structure is a double refraction periodic structure having a periodic or non-periodic uneven structure, uniform in the y-axis direction or having a larger length than that in the z-axis direction, and formed by being laminated in a layered shape in the z-axis direction by repeating the shape in every cycle shorter than a first Bragg condition in the z-axis direction. This double refraction periodic structure has a high refractive index medium layer 1 mainly composed of Si or TiO<sub>2</sub> or Ta<sub>2</sub>O<sub>5</sub> or Nb<sub>2</sub>O<sub>5</sub> or Si<sub>3</sub>N<sub>4</sub> and a low refractive index medium layer 2 mainly composed of SiO<sub>2</sub>, alternately.



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